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Characterizing the transmission dynamics and severity of 2009 H1N1 influenza pandemic in Hong Kong

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Background: We tested 14,766 sera collected during the first wave of pandemic influenza H1N1 (pdmH1N1) in Hong Kong using viral microneutralization (MN). Each serum specimen was tested for seropositivity at MN titers of 1:20 and 1:40. Combining these serologic data with clinical surveillance data, we estimated the transmission and severity parameters using an age-structured SIR model with four age groups: 0-12, 13-19, 20-29, and 30-59.

Methods: Combining data from serological study and clinical surveillance data obtained from E-Flu database in Hong Kong, we use an age-structured SIR transmission model to estimate transmission and severity parameters of pdmH1N1, such as basic reproductive number and case hospitalization probability.

Results: We estimated that the basic reproductive number was 1.49. Older age groups were more likely to possess immunity before the pandemic and were less susceptible to pdmH1N1 infections if they did not have pre-pandemic immunity. School closure reduced within-age-group transmission by 75% among the 0-12 year olds but only 26% among the 13-19 year olds. The mean delay between symptoms onset and seropositivity at MN titers 1:20 and 1:40 were around 3 and 10 days, respectively.

Conclusion: Serial cross-sectional serologic data together with clinical surveillance data can be used to completely characterize the transmission dynamics and severity of an influenza pandemic. Serologic monitoring should be considered in pandemic surveillance.

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The seroepidemiological profiles of dengue virus infection in southern Taiwan 2008-2010 and public health implications

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Background: During the last decade, Southern Taiwan has experienced several epidemics of dengue, caused by the virus (DENV) having annual outbreaks with predominant single serotype of DENV, of which viral transmission has been rarely detected before and after the epidemic. In addition, most Taiwanese cases were dengue fever cases in adults in contrast to SEA, where primarily were pediatric dengue hemorrhagic fever (DHF) cases. Nevertheless, profiles of seroprevalence in the regions where dengue outbreaks mainly occurred can providean overall picture to fully understand the transmission of different serotypes of DENV.

Methods: Two seroepidemiological studies in Tainan City and Kaohsiung City were conducted from 2008 to 2010. Tainan's study aimed to measure the seroprevalence after the DENV-1 epidemic in 2007, the largest epidemic since 1988. We chose 3 communities with the most dengue cases in 2007 to conduct cross-sectional serological surveys in August and September in 2008, and additional 4 schools in May 2009. Kaohsiung's study aimed to measure the seroincidence among subjects in community- and primary school-based cohorts, which encountered the DENV-3 epidemic in 2009. DENV-specific antibody was tested by ELISA.

Results: The overall seroprevalence of anti-DENV IgG was 7.2% of 167 Tainan's residents, significantly lower than those in two Kaohsiung's communities [27% (n = 96) in November 2009 and 35% (n = 71) in March 2010]. The overall infection rates of DENV in schoolchildren were quite lowin both cities (3.3% versus 2.2% in 1,108 Tainan's and 1,153 Kaohsiung's schoolchildren, respectively) and 1 Kaohsiung's child living in Xiaogang district had seroconversion.

Conclusion: DENV transmission in Kaohsiung was higher than Tainan. However, the vector control program did succeed in containing the transmission among schoolchildren. Further works on serotyping is in progress to clarify the magnitude of infection by different serotypes of DENV.

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A matched case-control study identifies activities of daily living associated with acquisition of melioidosis in northeast Thailand

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Background: Melioidosis is a fatal infectious disease caused by the Category B select agent and environmental saprophyte, *Burkholderia pseudomallei*. Naturally acquired infection is common in Thailand after exposure to soil and water. The relative importance of bacterial inoculation, inhalation and ingestion as routes of infection and the relevance of a range of activities of daily living are not known. This is a barrier to the development of guidelines for prevention.

Methods: We conducted a prospective hospital-based matched case-control study in northeast Thailand. Cases were patients